

**USDA
NATURAL RESOURCES
CONSERVATION SERVICE**

**INTERIM
MARYLAND CONSERVATION
PRACTICE STANDARD**

**AGRICHEMICAL HANDLING
FACILITY**

**CODE 702
(Reported by No.)**

DEFINITION

An agrichemical handling facility is a permanent structure with an impervious surface to provide an environmentally safe area for the handling of on-farm agrichemicals, such as pesticides and fertilizers, that are used in spraying operations of orchards, vineyards and cropland.

PURPOSE

This practice may be applied as part of a conservation management system to support one or more of the following purposes:

1. To provide a safe environment for the mixing and loading of chemicals and to retain incidental spillage for proper handling and disposal;
2. To reduce pollution to surface water;
3. To reduce pollution to groundwater;
4. To reduce pollution to soil.

**CONDITIONS WHERE PRACTICE
APPLIES**

This practice applies where:

1. The lack of adequate facilities for the mixing of chemicals creates significant potential for pollution of surface water, groundwater or soil;

2. A water supply is adequate for filling application equipment tanks, rinsing application equipment and chemical containers;
3. Soils and topography are suitable for construction; and,
4. The applicator has determined that an impermeable pad is required to properly manage chemical operations.

CONSIDERATIONS

The agrichemical handling facility will cause an increase in water use at the site from the mixing of chemicals and rinsing of chemical sprayers, containers and chemical-mixing pad, but will be of minor concern due to the low volumes of water used. The quantity of runoff will increase due to the area roofed at the facility, but will be of minor impact due to the limited size of the structure and its rural locations.

CRITERIA

Location

The agrichemical handling facility shall be located as follows:

1. Adjacent to or as near the chemical storage building as practical;
2. As far as practical from streams, ponds, lakes, wetlands, and wells, with a minimum distance of 100 feet;
3. As far as practical from known sinkholes and subsurface anomalies, with a minimum distance of 100 feet;
4. Isolated and located downwind from residences and other buildings used to store feed, seed, petroleum products, and livestock;
5. Located above the 100-year floodplain elevation or, where this is not practical, as a minimum above the 25-year floodplain elevation with authorization from the Maryland Department of the Environment. The facility shall be designed to prevent runoff from adjacent land and structures from entering the facility during a 25-year, 24-hour rainfall event;

Conservation practice standards are reviewed periodically, and updated if needed. To obtain the current version of this standard, contact the Natural Resources Conservation Service.

6. At sites that have not been used as stationary mixing/loading sites in the past.

Components

The system for an agrichemical handling facility shall include those components necessary to properly handle the chemical mixture and prevent pollution of the environment. Outlet drains are not permitted in the chemical collection area or the chemical-mixing and loading pad. Components of a complete facility must include, but are not limited to, the following:

1. A sealed concrete pad for chemical mixing and loading;
2. An impermeable liner installed under the concrete mixing and loading slab;
3. A chemical collection sump, sump pump, and safety devices;
4. Adequate water supply for mixing chemicals, rinsing tanks and containers, and for emergency health and safety needs;
5. Water supply pump, pipeline, hoses, backflow prevention devices, and other hardware needed for water control;
6. Emergency shower/eyewash station;
7. Tanks for storage of rinsate;
8. Where needed, a storage space of sufficient size to accommodate short-term storage of chemicals commonly used in the landowner's operation;
9. Electrical components such as lights, fans, outlets, switches, etc.;
10. Warning signs, fire extinguisher, first aid kit, protective clothing, and other appropriate safety devices;
11. Approved Operation, Maintenance, and Safety Plan.

Although optional, it is highly recommended that the concrete pad be roofed, and that a mixing platform be available when filling chemical sprayer. It is preferable to have a separate building for chemical storage. At a minimum, separation of stored chemical from the mixing area by wall or separate room is required.

Federal, State, and Local Laws

Those planning and designing chemical handling and mixing facilities shall strictly adhere to all federal, state and local laws. Specific requirements for pesticide storage (including insecticides, herbicides, fungicides, etc.) are being developed by the Maryland Department of Agriculture, Pesticide Regulation section, which is responsible for enforcing federal and state pesticide regulations. Maryland Cooperative Extension has developed guidelines for the handling and storage of pesticides. Refer to the "Maryland Pesticide Applicator Training Series - Core Manual" for details.

Producers shall be responsible for securing the necessary permits to install the required facilities and for properly managing the facility.

Pad

The width of the concrete pad used for the chemical mixing operation shall be the width of the largest sprayer, with the booms folded in, plus 10 feet. The length shall be as needed to accommodate the largest spraying equipment and may allow for access from more than one direction.

The minimum thickness of the concrete slab shall be six (6) inches and have minimum reinforcement of 6 inch by 6 inch, 6 by 6 gage welded wire fabric. The compressive strength of the concrete at 28 days shall be 4000 psi. It shall be poured with a slump of 1.5 inches to 3 inches. A concrete super plasticizer admixture shall be used during placement to improve workability and reduce voids and honeycombs. The concrete shall have air entrainment of 5% to 7.5% by volume. Wet curing shall be for a minimum of 7 days (14 days when pozzolan is used) or the application of a liquid membrane forming curing compound (ASTM C 309). Slabs having a span greater than 30 feet shall be provided with expansion joints and waterstops at a maximum spacing of 30 feet.

All concrete pads, whether roofed or open, shall be sealed with a non-vapor forming coating to protect the surface from deterioration from chemicals.

The chemical-mixing pad shall be sloped to allow for drainage of water and pesticide spills to a collection sump. The chemical-mixing pad shall be

sloped a minimum of 2% (1/4 inch per foot) toward the sump.

The chemical-mixing pad shall have a curb of sufficient height to prevent outside runoff water from entering and for providing storage of chemical spills. The chemical-mixing pad, including the sump, shall have a minimum storage capacity of 250 gallons or a capacity equal to 1.25 times the largest storage or spray tank brought onto the pad, whichever is greater. For an unroofed mixing/loading pad, it shall have the storage capacity as stated above or the volume of the 25-year, 24-hour storm, whichever is greater.

Impermeable Liner

An impermeable liner shall be installed beneath the concrete slab for additional protection to soil and water resources. The liner shall be installed with a minimum of 3 inches of granular material between the liner and the concrete to provide adequate drainage during construction. The impermeable membrane shall be resistant from deterioration from the chemicals used at the facility and shall be a minimum of 30 mils thick.

Chemical Collection Sump

A concrete box sump a minimum of 3 feet by 3 feet by 2 feet deep shall be constructed under the pad, and shall be covered with a metal grate.

The minimum concrete thickness of the sump walls and bottom shall be 8 inches. Reinforcement shall be as needed for structural requirements, but not less than #4 bars placed on 12-inch centers in each direction. The metal grate shall be constructed of galvanized steel and shall contain a cut out for the sump pump piping. A waterstop shall be used between the floor and walls of the sump, and between the sump walls and the concrete pad during construction to insure water tightness.

Other types of sump may be approved on a case by case basis, but must be supported by strength design computations and water tightness details.

Sump Pump

The sump pump shall be a chemically resistant submersible pump or an above ground centrifugal or piston pump and shall create a minimum of

turbulence within the sump. The pump may be operated either electrically or manually. A filter shall be installed between the sump pump and sprayer or rinsate tanks.

All electrical components shall be waterproof and explosion proof for the submersible pump and waterproof for the above ground pump. All electrical components shall be installed in accordance with local and national electrical codes.

Water Supply, Pump, and Pipe

A reliable water supply shall be provided to the pad at 5 gallons/minute (minimum rate) for filling the sprayers and rinsing the chemical containers, spray tanks, and chemical-mixing pad. A hose or pipeline shall be installed for conveyance of water from the water supply to the pesticide containment facility. Back flow preventers, antisiphoning devices, and a method to allow winterizing of the pipelines shall be installed on all water supply lines. The water supply pump and wells shall be located outside of the pesticide containment facility.

Plumbing

All parts of the plumbing system shall be corrosion resistant. No appurtenances, discharge outlets, drains or other piping shall be installed through the concrete pad, curb, or sump. All plumbing shall be designed to allow for easy drainage to prevent freezing.

Emergency Washing Area

A permanent water supply line shall be installed at the containment facility. The emergency washing area shall be conveniently located on the pad and easily accessible to the applicator. The emergency washing area shall include a faucet and emergency eye wash station. A drop shower is strongly recommended.

Entrance

The entrance to the chemical-mixing pad shall be graveled, paved, or otherwise treated to provide a suitable entrance for the equipment and to prevent erosion and the tracking of sediment onto the chemical-mixing pad. Minimum width of the entrance shall be 4 feet wider than the widest piece of equipment used at the facility. The length of

the entrance shall be a minimum of 1.5 times the largest wheel circumference of the equipment used at the facility.

Loading Platform

A loading platform may be used to facilitate the filling of the spray equipment. The recommended minimum platform size is 2.5 to 3 feet high, with a minimum work area of 3 feet by 4 feet and is moveable on the pad.

Roof

Where site conditions warrant, use of a roof to cover the pad is strongly encouraged. Design of the roof shall meet all local and state codes. Drawings of the roof shall be submitted for approval prior to being installed.

Fully enclosed buildings shall be adequately ventilated by natural or mechanical means at all times.

Rainfall and Runoff Exclusion

All surface water shall be diverted from the concrete pad and access ramp, if used, using dikes or mountable berms. Clean water from roof areas shall be diverted from the agrichemical handling facility location.

Rinsate Storage Tanks

Rinsate storage tanks shall be provided to temporarily hold rinsates resulting from cleaning the chemical-mixing pad or sprayer. The rinsate tanks shall be located on the chemical-mixing pad.

The tanks shall be labeled with type of chemicals and target crops. Tanks shall be fiberglass, polyethylene, or other durable material and have the capacity to meet the requirements of the operation plan. A separate tank shall be provided for each target crop. Herbicides should be kept in separate tanks from any other compounds.

Bulk Storage Tanks

Where bulk tanks (56 gallons or larger) are to be located within the mixing and storage area, a secondary containment structure shall be designed and constructed to contain discharges and prevent escapes, runoff, and leaching of pesticides. The

secondary containment area (walls and pad) must be impervious and constructed to hold 110% of the volume of the largest storage tank.

Safety

Highly visible waterproof warning signs, such as "CAUTION, CHEMICAL STORAGE AREA," or similar signs shall be posted at all entrances to the facility. "NO SMOKING" signs shall be placed both outside and inside the facility. Bilingual signs are recommended. All signs (size, location, color, etc.) shall meet the requirements of Occupational Safety and Health Administration (OSHA) 29 CFR 1910.144 and 29 CFR 1910.144; American National Standards Institute (ANSI) Z35.1-1979, Z35.4-1973, Z525.1-1991, and Z535.2-1991; and any applicable federal, state, or local laws and regulations.

Where chemicals are stored on-site, the storage facility shall be secured to provide reasonable protection against vandalism or unauthorized access. The chemical storage area shall include appropriate safety devices including ventilation, lighting, fire extinguisher (ABC use rating, dry chemical, minimum 20 pound capacity), and a smoke detector with an audible alarm.

Normal winterization procedures to prevent damage to the facility and to chemical containers shall be performed when weather conditions dictate.

Protection of Disturbed Areas

All areas disturbed during construction shall be seeded or sodded as necessary to prevent erosion. Areas shall be vegetated in accordance with the NRCS Maryland conservation practice standard for Critical Area Planting, Code 342.

SPECIFICATIONS

Plans and specifications for constructing agrichemical handling facilities shall be prepared in accordance with the criteria contained in this standard, and shall describe the requirements for applying the practice to achieve its intended use.

OPERATION AND MAINTENANCE

Operation and maintenance shall be in accordance with the requirements of this standard, and in keeping in conformance with all local, state, and federal laws and regulations.

The operation and maintenance (O&M) plan shall include an inventory of chemicals used at the facility and the methods proposed for handling of sediment, rinsate, and potential spills. An emergency response plan with the emergency spill and poison center telephone numbers shall be part of the O&M plan. Material Safety Data Sheets (MSDS) for chemicals used shall be attached to the O&M plan. A copy of the O&M plan shall be located at the agrichemical handling facility.

The agrichemical handling facility shall be kept free of items not necessary for the storing, mixing, loading, and cleanup operations. The facility shall not be used for purposes other than the storing, mixing, loading, cleaning and maintenance of materials and equipment used for chemical application.

Do not drain rinse water or rinsate from the sprayer onto the pad as a standard practice due to the probability of contamination by soil, trash and other pesticides.

The sump shall be thoroughly cleaned between the mixing and loading of different chemicals. The resulting rinsate can be applied as a dilute pesticide to a labeled site or used as dilution water for subsequent batches of the pesticides that are labeled for the same crop. The sump shall be pumped dry at the end of each day of operation.

Sediment from the sump shall be removed with proper precautions taken to reduce exposure of the worker to any potential contaminants in the sediment. Sediment from a pesticide is considered the same weight active ingredient as the formulated chemical being mixed. If this sediment is land applied, it shall be applied to the target crop at a

rate below the label recommendation. The sediment shall be removed from the sump prior to switching from one chemical to another chemical.

All material removed from the chemical-mixing pad and sump must be properly utilized or disposed of. Appropriate uses and disposal methods are:

1. Application to the target crop as pesticide;
2. Use as dilution water in mixing to be applied to the target crop; or,
3. Disposal as waste in conformance with all local, state, and federal regulations.

The rinsate tanks used as holding tanks for sump discharge shall be emptied as soon as possible. Rinsate tanks shall not be used to store sump discharges of different chemicals. The rinsate can be applied as a dilute pesticide or used as dilution water for subsequent batches of pesticides that are labeled for the same crop.

The agrichemical handling facility shall be inspected periodically to ensure proper operation. The inspection shall include, but is not limited to:

1. Concrete pad;
2. Protective coating on the surfaces of the concrete pad, sump, and sidewalls;
3. Operation of back flow prevention devices;
4. Hoses, pipes, valves, connectors, filters, tanks, and related plumbing material;
5. Sump and sump pump;
6. Safety equipment;
7. Electrical systems and controls;
8. Roof and structural integrity of facility;
9. Access roads and ramps;
10. Drainage around building;
11. Labeling of rinsate storage tanks that will ensure proper methods for applying rinsate back to the land;
12. Chemical inventory.

SUPPORTING DATA AND DOCUMENTATION

Field Data and Survey Notes

Record on survey note paper, SCS-ENG-28 & 29, the following minimum data:

1. A topographic survey of the site location;
2. Location of all buildings, wells, and other permanent features adjacent to the site;
3. Profile from the site to possible drain outlet;
4. Size and capacity of all sprayers;
5. Soil investigation notes and potential high water.

Design Data

Record on appropriate engineering paper. For guidance on the preparation of engineering plans see Chapter 5 of the Engineering Field Handbook, Part 650. The following is a list of the minimum required design data:

1. A plan view of the facility with contours, buildings, well, streams, etc.;
2. Detail designs of the components: pad, curb, sump, pump configuration, etc.;
3. Calculations showing design and required storage capabilities;
4. List of quantities with supporting computations;
5. Erosion and sediment control measures, and surface water control devices;
6. Show construction specifications on drawings.

Construction Check Data

Record on survey note paper, SCS-ENG-28, or other appropriate engineering paper. Survey data shall be plotted on plans in red. The following is a list of minimum data needed for As-builts:

1. Documentation of site visits on CPA-6. The documentation shall include the date, who performed the inspection, specifies as to what was inspected, all alternatives discussed, and decisions made and by whom;
2. Final survey elevations of the pad;
3. Final depths and dimensions of the curb, sump, etc.;
4. Size and location of all rinsate tanks;
5. Location of buried pipelines and power cables where installed as part of facility;
6. Final quantities and documentation for quantity changes, and materials certification;
7. Sign and date check notes and plans by someone with appropriate approval authority. Include statement that practice meets or exceeds plans and NRCS practice standards.

REFERENCES

1. American Society for Testing and Materials. *ASTM Standards*. Philadelphia, Pennsylvania.
2. Curtis, W. M., and A. E. Brown. *Maryland Pesticide Applicator Training Series - Core Manual*. University of Maryland, Maryland Cooperative Extension., College Park, MD.
3. Daum, D. R., and D. J. Meyer. *Pesticide Storage Building*. Pennsylvania State University, Agricultural Engineering Department.
4. Doane's Agricultural Report. *Chemical Containment Facilities*. Vol. 53, No 36-5.
5. Kammel, D. W., 1988. *Protective Treatment for Concrete*. Agricultural Engineering Department, University of Wisconsin.
6. Noyes, R. I., 1989. *Modular Farm Sized Concrete Agricultural Chemical Handling Pads*. Oklahoma State University, Agricultural Engineering Department.
7. Noyes, R. T., and D. W. Kammel, 1989. *A Modular Containment, Mixing/Loading Pad*. ASAE Paper No 891613, American Society of Agricultural Engineers, Winter Meeting, New Orleans, LA.
8. USDA, Natural Resources Conservation Service. *Conservation Practice Standard for Critical Area Planting, Code 342*. Maryland Field Office Technical Guide, Section IV.
9. USDA, Natural Resources Conservation Service. *Preparation of Engineering Plans*. Engineering Field Handbook, Chapter 5.